



Australian Government

Californian Air Resources Board

7 March 2007

Mitigation Down Under Greenhouse Emissions Reduction Programmes in Australia

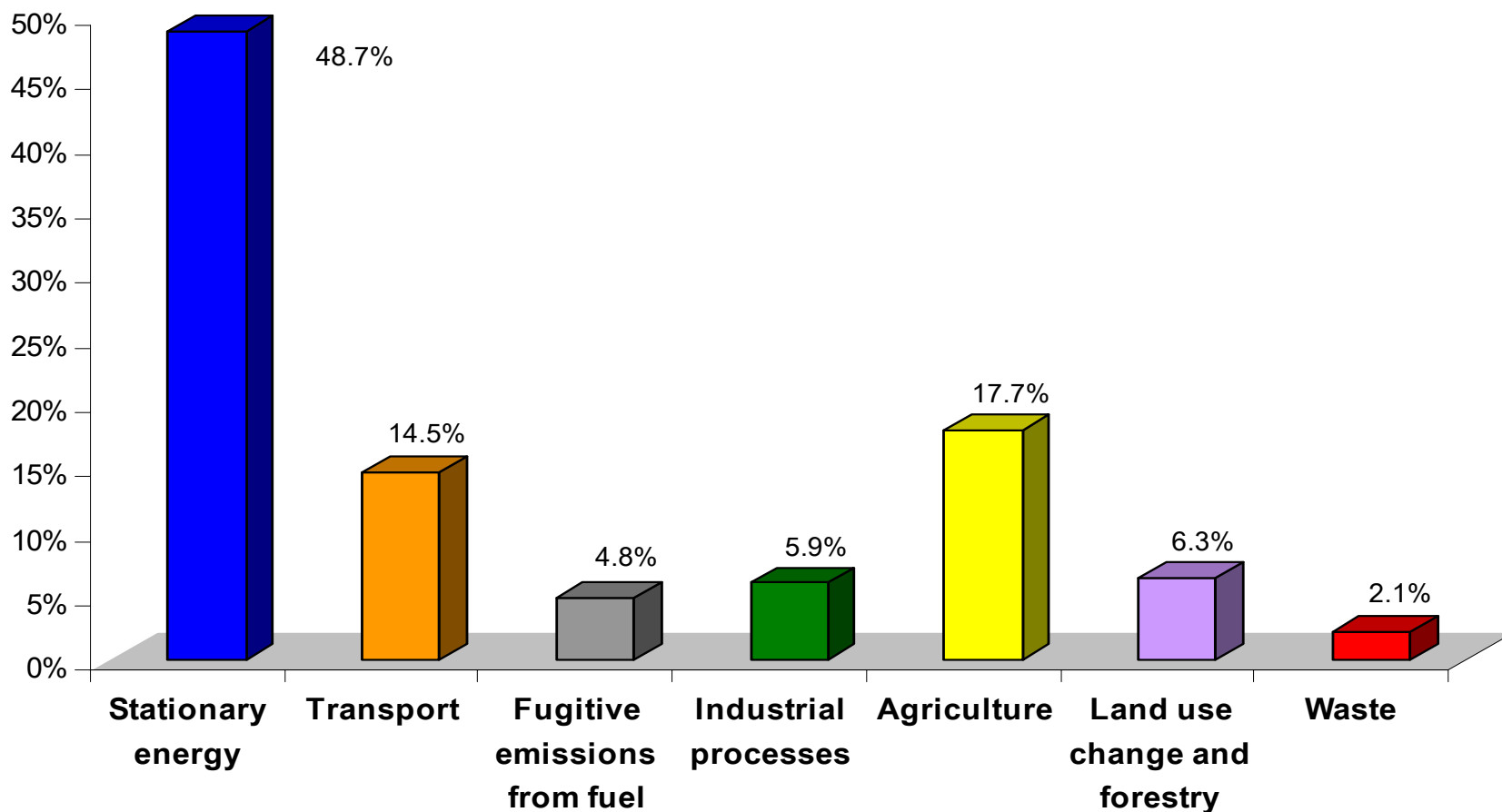
Jean-Bernard Carrasco
Australian Greenhouse Office
Department of the Environment and Water Resources



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Stationary energy dominates Australia's emissions profile...

Australia - Emissions Profile by Sector



Source: 2003 National Greenhouse Gas Inventory (Australian Greenhouse Office) 2005



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Australia's Strategy

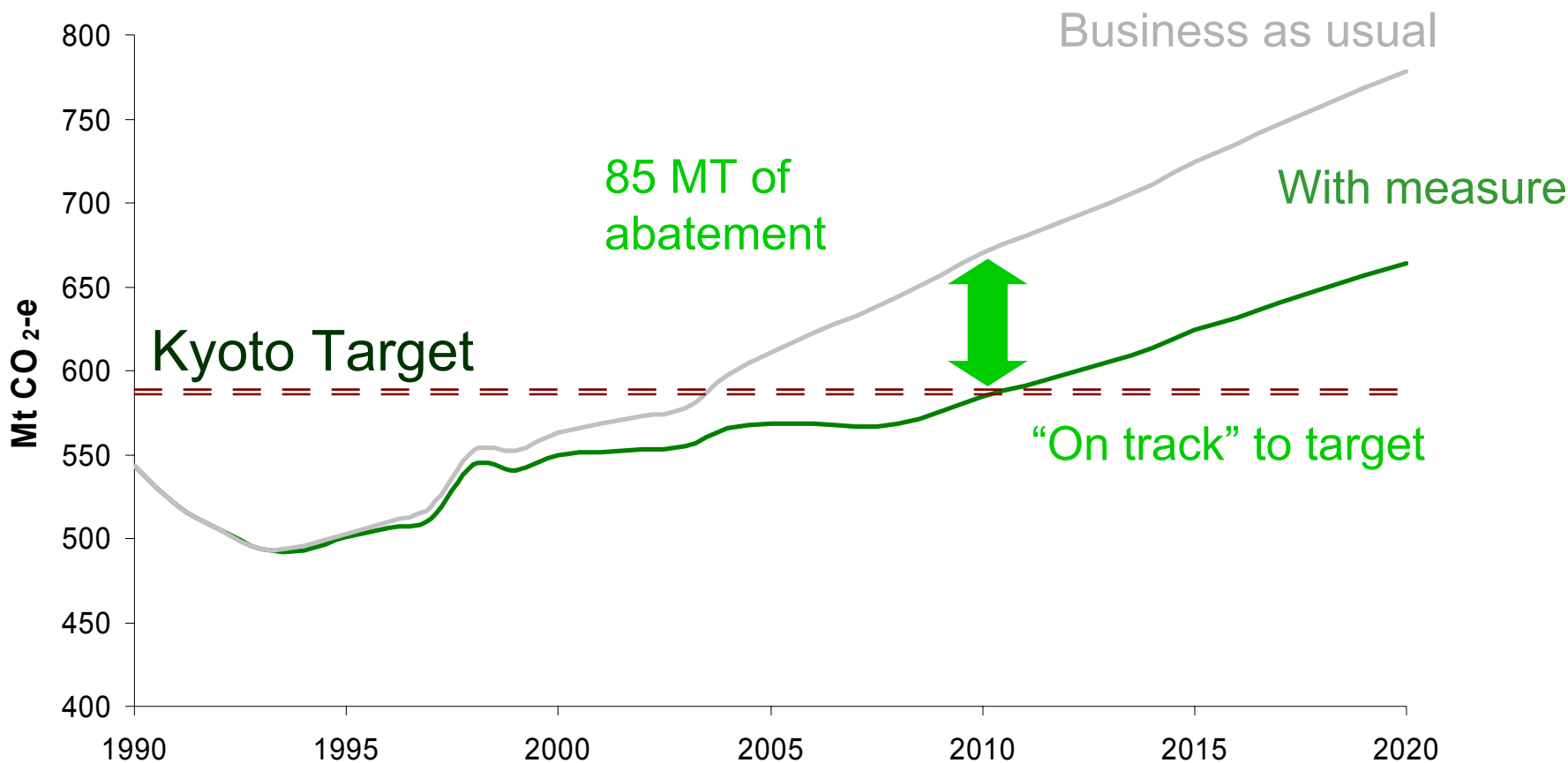
- Focus on long term options and solutions
 - Develop low emission technology
 - Remove market failures and barriers to take up
 - Reduce cost of future GHG responses
- And in the meantime
 - Implement existing measures to achieve Kyoto target
 - Build industry capacity to manage emissions
 - Promote energy efficiency



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Committed to meet Kyoto target

Australia's 2005 Greenhouse Gas Emissions Projection





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Cross sectoral programmes

- **Greenhouse Challenge Plus**
- **Greenhouse Gas Abatement Programme**
- **Low Emissions Demonstration Fund**
- **Local greenhouse action – cities for climate protection**



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Greenhouse Challenge Plus



- 1995 - voluntary industry partnership: monitor, reduce, report and independently verify emissions
 - reduce greenhouse gas emissions
 - accelerate uptake of energy efficiency
 - capacity building - integrate greenhouse issues into business decision making
- Businesses sign cooperative agreement with Government
- National, 750 businesses, 50% of industrial emissions covered
- 15 Mt CO₂-e abatement in 2010



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Greenhouse Challenge Plus



Mandatory membership:

1. Businesses claiming >\$3 million in Fuel Tax Credits p/a
 - ensure major fuel users addressing emissions: transport and mining
 - non-compliance: claims capped at \$3m by Tax Office
2. Large energy resource development projects
 - > 500,000 Mt CO₂-e
 - projections of emissions at EIS stage
 - join at project commencement



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Challenge Plus lessons

- Drivers: bottom line (\$), corporate social responsibility and capacity building
- Industry needs time and assistance to build expertise in monitoring and reporting
- Independent verification: key to credibility of programme
- One of a suite of Government programmes
 - national and state programmes operating in all jurisdictions
 - reporting fatigue and cost: required to report energy and greenhouse multiple times



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Greenhouse Gas Abatement Project

- Focus on large scale abatement for the period 2008-12
 - 6.6 Mt CO₂-e abatement in 2010
- 17 projects approved, includes:
 - fuel conversion
 - co-generation
 - forestry
 - waste coal mine gas
 - HFC recovery (refrigeration)



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GGAP – challenges/lessons

- 5 – 7 years to implement most projects
- Difficulty with demonstrating additionality
- Long term financial commitments for Government
- Multiple parties for each project



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Energy Efficiency

Action on Energy Efficiency

- **Equipment and Appliances**
- Buildings
- Government operations
- Finance

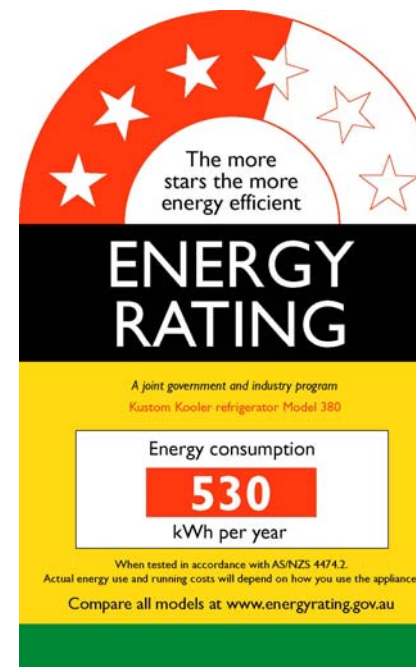
Energy Efficiency Opportunities



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Equipment & Appliances

- Minimum Energy Performance Standards on appliances and equipment
- Mandatory energy labelling for domestic appliances
- 7.9 Mt CO₂-e abatement in 2010





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Energy Efficiency Opportunities

- Mandatory for companies using > 0.5 petajoules of energy per year (approx 250 companies)
 - assess and report on energy efficiency opportunities.
- Designed to lead to:
 - improved identification and uptake of energy efficiency
 - improved productivity and reduced greenhouse gas emissions



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Low emission and renewable energy

- **Mandatory Renewable Energy Target**
- **Solar Cities**
- Renewable Energy Development Initiative
- Advanced energy storage technologies
- Wind Energy Forecasting Capability
- National Green power Accreditation Programme



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Mandatory Renewable Energy Target

- Requires 9,500 gigawatt hours of extra renewable electricity per year by 2010 through to 2020
 - *Renewable Energy (Electricity) Act 2000*
- Liability on wholesale purchasers of electricity (e.g. retailers)
 - surrender Renewable Energy Certificates each year or pay penalty (\$40 per MWh)
- 6.6 Mt CO₂-e in 2010



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MRET - lessons

- Expected to generate additional A\$2-3 billion investment in renewable energy
- Investments likely in first five years of the measure
- Concern about cross subsidies from consumers – e.g. “greenpower”
- Large and small scale RE sources
 - 228 “power plants” and 130,000 solar water heaters and small generation units.
- Compliance rate is high (99.8 % for 2004)

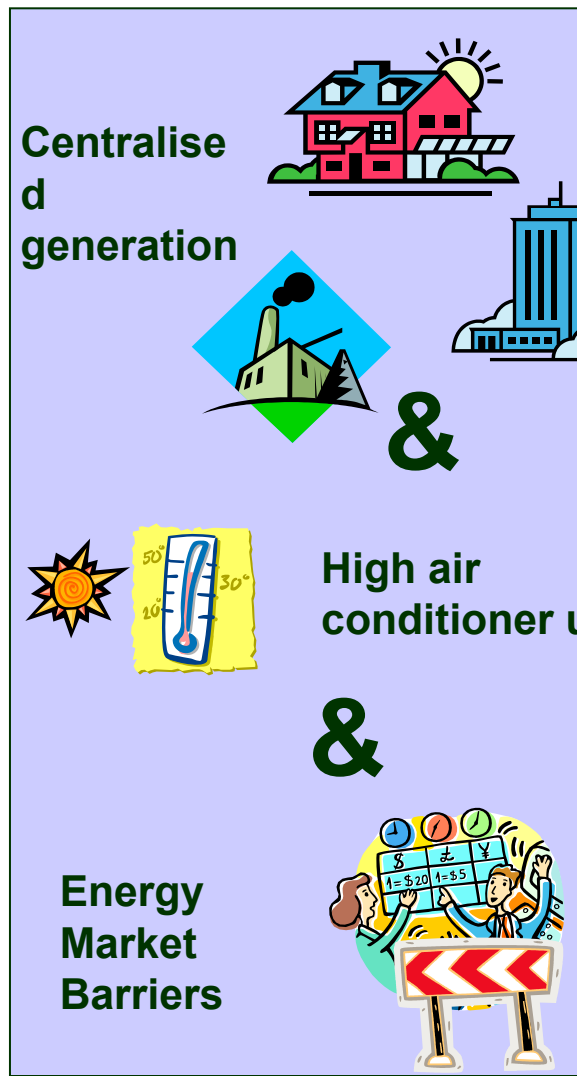


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Solar Cities

Integrated trial of:

- Cost reflective pricing
- Smart metering
- Distributed generation
- Energy efficiency
- Community awareness





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Low emissions and renewable energy

- **Renewable Remote Power Generation Programme**
- **Renewable Energy Commercialisation Programme**
- The Renewable Energy Equity Fund
- The Photovoltaic Rebate Programme



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Renewable Remote Power Generation Program

- Up to 50% of the cost of RE generation equipment that reduces reliance on fossil fuel in remote, off-grid areas of Australia.



Photos courtesy PSMC





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Renewable Energy Commercialisation Program



- \$50m RECP run through 6 competitive rounds between 1998 and 2001
- Grants of up to \$1m, almost every renewable energy technology

Image courtesy Solar Systems



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Transport and alternative fuels

- **Alternative Fuels Conversion Programme**
- Fuel Consumption Labelling Scheme
- Green Vehicle Guide
- Environmental Strategy for the motor vehicle industry



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Alternative fuels conversion programme

- Assistance to industry to develop and trial natural gas and LPG engines in heavy duty vehicles





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Agricultural emissions

- R&D, monitoring and reporting methodologies
- Mitigation focus on increasing resource use efficiency
 - Increasing feed conversion efficiency in livestock
 - Optimising efficiency of nitrogen use by crops & pastures
 - Improving energy efficiency on farms



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Our technology strategy

| | |
|---|---------------|
| Low Emissions Technology Demonstration Fund | \$500m |
| Renewable Energy Development Initiative | \$100m |
| Solar Cities | \$75m |
| Advanced Electricity Storage Technologies | \$20m |
| Wind Energy Forecasting Capability | \$14m |
| Further support for National Electricity Code reform | |



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“No gaps” support for technology development

Transferring technology

- Mandatory Energy Performance Standards
- AP6 working groups
- Bilateral agreements and technology working groups

Driving Uptake

- Mandatory Renewable Energy Target
- PV Rebates
- Renewable Remote Power Generation
- Greenhouse Gas Abatement Program

Removing barriers and building capacity

- Solar cities
- Wind Energy Forecasting
- LET and abatement
- Grid accessibility
- RE Industry Development

Demonstration and Commercialisation

- LET Demonstration
- RE Development
- Advanced Electricity Storage
- RE Commercialisation
- RE Equity Fund
- Alternative Fuel Commercialisation

Research and development

- Backing Australia's ability
- Cooperative Research Centers
- Tax incentives
- Greenhouse Action in Regional Australia

price signals



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Lessons – R&D

- Some support through general R&D programs – not focused on energy technologies
 - solar PV, hot rocks, wind-diesel etc.
- Some commercialisation and large abatement grants have suffered from “R&D is not ready”
 - Eg: Alternative fuels, GGAP
- Do we have enough input at the front of the chain?
 - OECD and IEA say no – investment in R&D is insufficient and declining



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Lessons – demonstration and commercialisation

Nature of risk taking

- Willingness to accept a failure rate
- Long time frames for grants versus budgetary cycles
- Underestimating costs
- Picking winners and competitive selection



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Thank You

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